



NARRATIVE

October 7, 1992

Narrative Project: Site Wide Soil IV
Reference No.: 32359-42
Client: WHC
SDG No.: 3260

METALS

The samples were analyzed according to EPA Method 6010 and the 7000 series for the TCL metals list and Mo. No dilutions were required for analysis.

The quality control results were generally acceptable. Several MS recoveries and duplicate RPDs were outside established windows and are flagged. The soil LCS recoveries are within advisory ranges.

ANIONS

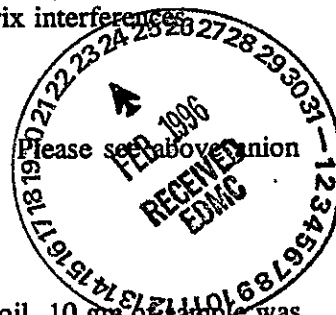
The samples were analyzed according to EPA Method 300.0. For soil, 10 gm of sample was leached into 50 mL of DI Type II water prior to analysis. The quality control results were generally acceptable. MS recovery for Cl was outside the control limits, this is possibly due to matrix interferences.

NO₂/NO₃

The samples were analyzed according to EPA Method 300.0 for NO₂/NO₃. Please see above union narrative for additional notes.

SULFIDE

The samples were analyzed according to EPA Method 9030 for sulfide. For soil, 10 gm of sample was leached into 50 mL of DI Type II water prior to analysis. The quality control results were acceptable.





NARRATIVE

TOTAL ALKALINITY

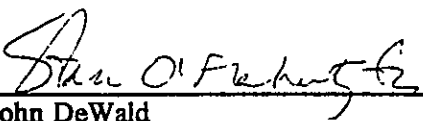
The samples were analyzed according to EPA Method 310.1 for total alkalinity. There were no difficulties with the analyses. The quality control results were acceptable. %RPD and MS recovery were within the control limits.

TOTAL ORGANIC CARBON

The samples were analyzed according to EPA Method 9060 by combustion and then IR analysis. Prior to analysis, a sample aliquot was measured and phosphoric acid was added to the soil. The mixture was placed in an oven at 70 C for one hour, then removed, cooled, and ground to a fine powder texture. The sample then went through the combustion and IR analysis process. The quality control results were acceptable. %RPD was within the control limits.

TOTAL CARBON

The samples were analyzed according to EPA Method 9060 by combustion and then IR analysis. Prior to analysis, a sample aliquot was ground to a fine powder texture. The sample then went through the combustion and IR analysis process. The quality control results were acceptable. %RPD recovery was within the control limits.



John DeWald
Project Manager

enclosures

I:\report\narr\n3260

SDG Memo/Sample Summary

Client Name: WESTINGHOUSE HANFORD CO. **Date:** 25 Sep 1992
Project Name: SITE WIDE IV **Update No.:**
SDG No.: 3260 **Work Order No.:** 32359-42
Project Manager: J. DEWALD
Mail Date:

Client Samp No.	S-Cubed Samp No.	Date Rcvd	Date Samp	Matrix	ANIONS	FURN7000	HG7000	ICP6010	NO2/NO3	S	TALK	TC	TOC
B06JCZ	3260-01	8-28-1992	8-25-1992	SOIL	X	X	X	X	X	X	X	X	X
B06JCZMS	3260-01MS	8-28-1992	8-25-1992	SOIL	X	X	X	X	X	X	X	X	X
B06JCZREP	3260-01REP	8-28-1992	8-25-1992	SOIL	X	X	X	X	X	X	X	X	X

(X) = Non-Billable Sample

32259-47

53/107-3260

Westinghouse Hanford
Company

CHAIN OF CUSTODY

Custody Form Initiator Bruce Bjornstad
Company Contact U.G. Lucas Telephone 376-2789
Project Designation/Sampling Locations Yakima Barricade Borehole Collection Date 8/25/92
699-48-96 @ 569 Ft BLS 0900
Ice Chest No. RM #33 Field Logbook No. EFL-1023
Bill of Lading/Airbill No. 2509870154 Offsite Property No. W92-U-057
Method of Shipment Emeru
Shipped to S-Cubed San Diego, CA
Possible Sample Hazards/Remarks Cool 4°C

Sample Identification

BOGJC2 - (1) 250 ml amber
glass sample container

☐ Field Transfer of Custody

CHAIN OF POSSESSION

(Sign and Print Names)

Relinquished by: <u>Bruce Bjornstad</u> <u>Bruce Bjornstad</u>	Received by: <u>C.D. Kramer</u> <u>C.D. Kramer</u>	Date/Time: <u>8/25/92</u> <u>11:30</u>
Relinquished by: <u>C.D. Kramer</u> <u>C.D. Kramer</u>	Received by: <u>Jonathan G. Lucas</u> <u>Jonathan G. Lucas</u>	Date/Time: <u>8-25-92</u> <u>1226</u>
Relinquished by: <u>Jonathan G. Lucas</u> <u>Jonathan G. Lucas</u>	Received by: <u>8/25/92</u> <u>11:00</u>	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:
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Comments:

II

53 Lot # 3200



PART I: FIELD SECTION

Date Sampled 8-25-92 Time 0900 hours

Telephone (509) 376-2784

Field Information**

Special Handling and/or Storage Cool 4°C

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by _____ Title _____ Date _____

Analysis Required

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location.

VI

4-6000-406 (05.90)

Date Received: 8-28-1992

Date Sampled: 8-25-1992

Client Code: WHC

DC No. _____

Time Received: 11:00

Data Due Date: 9-17-1992

Report Mail Date: 9-25-1992

Received by (Sig): [Signature]

Custody Seals Present/Intact ☒ Y ☐ N Reporting Level: FULL CLP

Airbill No. 2508870154

Chain of Custody Present/Intact ☒ Y ☐ N Turnaround Required: 30 DAY

Charge No. 32359-42

Client Forms Present

☒ Y ☐ N Quality Control Req'd: Level 3 (RCRA)

Case No./Project Code: SITE WIDE IV						SDG No.: 3260											All Info Agree	Notes
S-Cubed Sample No.	Sample Identification	Samp. Type	No. Cont.	Samp Stor.	Samp Cond	%M	ANIONS	FURN7000	HG7000	ICP6010	NO2/NO3	S	SPH	TALK	TC	TOC		
3260-01	B06JCZ	SOIL	1	16	OK	X	X	X	X	X	X	X	X	X	X	X		
3260-01MS	B06JCZMS	SOIL	1	16		X	X	X	X	X	X	X	X	X	X	X		
3260-01REP	B06JCZREP	SOIL	1	16		X	X	X	X	X	X	X	X	X	X	X		

Container Types

Water

Soil

Soil = Soil/Sediment/Sludge
Water = Aqueous
NAL = Non-Aqueous Liquid
NSS = Non-Soil Solid

Water MS,MSD _____
Soil MS,MSD _____
SDG Complete ☒ Y ☐ N

Review JD 8/31

S - CUBED

Trace Inorganics Report

Client: WHC
Project: SITE WIDE IV
Sampling Date: 08-25-02

Analyst: CB
Review: CLN 9/10
Receipt. Date: 08-28-92

Analyte: S

[illegible]

Method Detection Limit: 1.000 mg/L
Preparation Method: 9030
Analytical Method: 9030
Preparation Date: 09-01-92
Analysis Date: 09-01-02

UN = Units = (A=mg/kg B=ug/L C=mg/L) MT = Matrix = (S=Soil W=Water)

Comments: All GC data were acceptable. 10 gm of soil was leached into 50 mL DI type water prior to analysis.

S - CUBED

Trace Inorganics

Laboratory Control Sample Summary

Client: WHC
Project: SITE WIDE IV

Units: mg/L Analyte: S

[illegible]

Comments:

INORGANIC ANALYSES DATA SHEET

3260-01

Lab Name: S_CUBED_____ Contract: 32359-42_____

Lab Code: S3_____ Case No.: SWIV_____ SAS No.: _____ SDG No.: 3260_____

Matrix (soil/water): SOIL_____ Lab Sample ID: 3260-01_____

Level (low/med): LOW_____ Date Received: 08/28/92

% Solids: _____75.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	16100	-	*	P
7440-36-0	Antimony	12.8	U	N	P
7440-38-2	Arsenic	3.7	-	N*	F
7440-39-3	Barium	147	-	-	P
7440-41-7	Beryllium	1.3	-	-	P
7440-43-9	Cadmium	0.80	U	-	P
7440-70-2	Calcium	8110	-	-	P
7440-47-3	Chromium	29.3	-	N	P
7440-48-4	Cobalt	12.0	B	-	P
7440-50-8	Copper	23.7	-	-	P
7439-89-6	Iron	68100	-	-	P
7439-92-1	Lead	11.8	-	-	F
7439-95-4	Magnesium	9970	-	-	P
7439-96-5	Manganese	487	-	N*	P
7439-97-6	Mercury	0.13	U	N	CV
7440-02-0	Nickel	26.1	-	-	P
7440-09-7	Potassium	2320	-	-	P
7782-49-2	Selenium	0.80	U	N	F
7440-22-4	Silver	4.0	-	N	P
7440-23-5	Sodium	159	B	-	P
7439-98-7	Molybdenum	2.7	U	N	P
7440-62-2	Vanadium	100	-	N*	P
7440-66-6	Zinc	77.1	-	-	P
7440-28-0	Thallium	0.80	U	N	F

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

B06JCZ_____

ANIONS ANALYSIS

PAGE 1 OF 1

LABORATORY: S-CUBED
CLIENT: WHC
PROJECT: SITE WIDE IV
LOT #: 3260
FILE #: ANI3260S
DISK #: ANI0928
METHOD NO.: 300.0

DATA REVIEWER: *AN 7/29*
PROJECT REVIEWER:
CHARGE #: 32359-42
DATE SAMPLED: 8-25-92
DATE RECEIVED: 8-28-92
PREP DATE: 09-17-92
DATE ANALYZED: 09-17-92

UNIT: MG/KG

SAMPLE TYPE: SOIL

LAB ID	F	BR	CL	NO2	NO3	PO4	SO4
3260-01	2.40	40.0	8.60	<.27	2.70	<.67	7.00

All QC requirement were within the control limit. 10 gm of soil sample was leached into 50 mL DI type water prior to analysis. MS recovery for Cl was outside the limit range possibly due to matrix interferences.

ANIONS ANALYSIS BENCHSHEET

PAGE 1 OF

LABORATORY: S-CUBED
 ANALYST: EA
 CHARGE #: 32359-42

LOT #: 3260
 FILE #: ANI3260S
 DISK #: ANI0928

UNIT: MG/KG
 SAMPLE TYPE: SOIL

FLUORIDE RESULTS
 METHOD DET. LIMIT: 0.02 SPIKE: 0.5 PPM

LAB ID	% MOISTURE	SAMPLE ALIQUOT (GM)	SAMPLE VOL (ML)	DIL. FACTOR	CONC. FOUND MG/L	FINAL CONC. MG/KG	ANALYSIS DATE	PREP DATE	METHOD DET. MG/KG	%REC.	RPD
3260-01	24.83	10	50	1	0.36	2.39	09/17/92	09/17/92	0.13		
3260-01S	24.83	10	50	1	0.75	4.98	09/17/92	09/17/92	0.13	77.6	
3260-01R	24.83	10	50	1	0.38	2.52	09/17/92	09/17/92	0.13		5.14

CHLORIDE RESULTS
 METHOD DET. LIMIT: 0.02 SPIKE: 0.5 PPM

LAB ID	% MOISTURE	SAMPLE ALIQUOT (GM)	SAMPLE VOL (ML)	DIL. FACTOR	CONC. FOUND MG/L	FINAL CONC. MG/KG	ANALYSIS DATE	PREP DATE	METHOD DET. MG/KG	%REC.	RPD
3260-01	24.83	10	50	1	1.29	8.58	09/17/92	09/17/92	0.13		
3260-01S	24.83	10	50	1	1.40	9.31	09/17/92	09/17/92	0.13	22.0	
3260-01R	24.83	10	50	1	1.26	8.38	09/17/92	09/17/92	0.13		2.35

ANIONS ANALYSIS BENCHSHEET

PAGE 2 OF

LABORATORY: S-CUBED
 ANALYST: EA
 CHARGE #: 32359-42
 UNIT: MG/KG

LOT #: 3260
 FILE #: ANI3260S
 DISK #: ANI0928
 SAMPLE TYPE: SOIL

NITRITE RESULTS
 METHOD DET. LIMIT: 0.04 SPIKE: 1 PPM

LAB ID	% MOISTURE	SAMPLE ALIQUOT (GM)	SAMPLE VOL (ML)	DIL. FACTOR	CONC. FOUND MG/L	FINAL CONC. MG/KG	ANALYSIS DATE	PREP DATE	METHOD DET. MG/KG	%REC.	RPD
3260-01	24.83	10	50	1	<.04	<.27	09/17/92	09/17/92	0.27		
3260-01S	24.83	10	50	1	0.9	6.3	09/17/92	09/17/92	0.27	94.1	
3260-01R	24.83	10	50	1	<.04	<.27	09/17/92	09/17/92	0.27		0.00

BROMIDE RESULTS
 METHOD DET. LIMIT: 0.1 SPIKE: 1 PPM

LAB ID	% MOISTURE	SAMPLE ALIQUOT (GM)	SAMPLE VOL (ML)	DIL. FACTOR	CONC. FOUND MG/L	FINAL CONC. MG/KG	ANALYSIS DATE	PREP DATE	METHOD DET. MG/KG	%REC.	RPD
3260-01	24.83	10	50	1	5.98	39.8	09/17/92	09/17/92	0.67		
3260-01S	24.83	10	50	1	7.06	47.0	09/17/92	09/17/92	0.67	108.0	
3260-01R	24.83	10	50	1	5.91	39.3	09/17/92	09/17/92	0.67		1.18

ANIONS ANALYSIS BENCHSHEET

PAGE 3 OF

LABORATORY: S-CUBED LOT #: 3260
 ANALYST: BA FILE #: ANI3260S
 CHARGE #: 32359-42 DISK #: ANI0928

UNIT: MG/KG SAMPLE TYPE: SOIL

NITRATE RESULTS METHOD DET. LIMIT: 0.1 SPIKE: 2 PPM

LAB ID	% MOISTURE	SAMPLE ALIQOT (GM)	SAMPLE VOL (ML)	DIL. FACTOR	CONC. FOUND MG/L	FINAL CONC. MG/KG	ANALYSIS DATE	PREP DATE	METHOD DET. MG/KG	%REC.	RPD
3260-01	24.83	10	50	1	0.40	2.67	09/17/92	09/17/92	0.67		
3260-01S	24.83	10	50	1	2.6	17.2	09/17/92	09/17/92	0.67	109.5	
3260-01R	24.83	10	50	1	0.41	2.70	09/17/92	09/17/92	0.67		1.24

ORTHO-PHOSPHATE RESULTS METHOD DET. LIMIT: 0.1 SPIKE: 5 PPM

LAB ID	% MOISTURE	SAMPLE ALIQOT (GM)	SAMPLE VOL (ML)	DIL. FACTOR	CONC. FOUND MG/L	FINAL CONC. MG/KG	ANALYSIS DATE	PREP DATE	METHOD DET. MG/KG	%REC.	RPD
3260-01	24.83	10	50	1	<0.10	<.67	09/17/92	09/17/92	0.67		
3260-01S	24.83	10	50	1	4.7	32	09/17/92	09/17/92	0.67	94.8	
3260-01R	24.83	10	50	1	<0.10	<.67	09/17/92	09/17/92	0.67		0.00

ANIONS ANALYSIS BENCHSHEET

PAGE 4 OF

LABORATORY: S-CUBED LOT #: 3260
ANALYST: EA FILE #: ANI3260S
CHARGE #: 32359-42 DISK #: ANI0928

UNIT: HG/KG SAMPLE TYPE: SOIL

SULFATE RESULTS

METHOD DET. LIMIT: 0.1 SPIKE: 2 PPM

LAB ID	% MOISTURE	SAMPLE ALiquot (GM)	SAMPLE VOL (ML)	DIL. FACTOR	CONC. FOUND MG/L	FINAL CONC. MG/KG	ANALYSIS DATE	PREP DATE	METHOD DET. MG/KG	%REC.	RPD
3260-01	24.83	10	50	1	1.05	6.98	09/17/92	09/17/92	0.67		
3260-01S	24.83	10	50	1	3.16	21.0	09/17/92	09/17/92	0.67	105.5	
3260-01R	24.83	10	50	1	1.06	7.05	09/17/92	09/17/92	0.67		0.95

**MAXWELL
S-CUBED**

ANALYTE: TC		CALIBRATION		QC SUMMARY				
METHOD REF.:	9060	STD 2000ppm	1979	MS	CONC 200	OBSERVED 203.9	%REC. 102	ACCEPT. 80-120
DATE:	9/9/92	STD 400ppm	402.4	LCS	2000	1981	99.1	80-120
ANALYST:	MM	STD 10ppm	10.05					
MATRIX:	Soil	CAL BLANK	0.115					

$\text{TOC CONC.} = (\text{TOC READING} / 2000) * (0.08\text{mg} / 0.00001\text{kg}) * \text{DIL FACTOR}$
 $\text{FINAL CONC.} = \text{TOC CONC.} / (1 - (\% \text{MOIST.} * 0.01))$

SAMPLE ID. (S3)	TC READING	DIL FACTOR	TOC CONC. (mg/kg)	%MOIS	FINAL CONC (mg/kg)	CLIENT SAMP.ID
EBS0909	3.4	1	3.4	0	0	
LCSS0909	1981	1	1981	0	1980	
3244-01	340.2	1	1360.8	4.23	1420	BO6JC1
3244-01REP	334.2	1	1336.8	4.23	1400	BO6JC1
3260-01	172.9	1	691.6	24.83	920	BO6JCZ
3260-01REP	166.3	1	665.2	24.83	880	BO6JCZ

MAXWELL S-CUBED

				QC SUMMARY					
ANALYTE:	TOC	CALIBRATION			CONC	OBSERVED	%REC.	ACCEPT.	
METHOD REF.:	9060	STD 2000ppm	1979	MS	200	203.9	102	80-120	
DATE:	9/9/92	STD 400ppm	402.4	LCS	2000	1981	99.1	80-120	
ANALYST:	MM	STD 10ppm	10.05						
MATRIX:	Soil	CAL BLANK	0.115						
TOC CONC.=(TOC READING/2000)*(0.08mg/0.00001kg)*DIL.FACTOR									
FINAL CONC.=TOC CONC./1-(%MOIST.*0.01)									

SAMPLE ID. (S3)	TOC READING	DIL. FACTOR	TOC CONC. (mg/kg)	%MOIS	FINAL CONC (mg/kg)	CLIENT SAMP.ID
EBS0909	3.4	1	3.4	0	3.4	
LCSS0909	1981	1	1981	0	1980	
3244-01	255.2	1	1021	4.23	1070	BO6JC1
3244-01REP	249.5	1	998	4.23	1040	BO6JC1
3260-1	54.6	1	218	24.83	290	BO6JCZ
3260-01REP	51.5	1	206	24.83	270	BO6JCZ

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3 - CUBED

Trace Inorganics Report

Client: WHC
Project: SITE WIDE IV
Sampling Date: 08-25-92

Analyst: EA
Review: an 7/10
Receipt. Date: 08-28-92

Analyte: TALK

[illegible]

Method Detection Limit: 20.000 mg/L
Preparation Method: 310.1
Analytical Method: 310.1
Preparation Date: 09-04-92
Analysis Date: 09-04-92

UN = Units = (A=mg/kg B=ug/L C=mg/L) MT = Matrix = (S=Soil W=Water)

Comments: All GC data were acceptable. RPD / MS ranges were within the control limits.